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**(12) UK Patent Application (19) GB (11) 2 041 384 A**

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(21) Application No 7904784  
(22) Date of filing 10 Feb 1979  
(43) Application published  
10 Sep 1980

(51) INT CL<sup>3</sup>  
C04B 19/04 31/36  
(52) Domestic classification  
C3N 12 22 3A3X 3C  
C3Y B260 F112 G390

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(58) Field of search  
C3N

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**(54) Improvements in and Relating  
to Board Products and Mouldings**

(57) A composition for the  
manufacture of building boards and  
mouldings, especially boards and  
mouldings for fire protection,  
comprising potassium silicate and/or  
sodium silicate, light weight

aggregate and cellulosic fibres.  
Preferred light weight aggregates are  
vermiculite and/or pulverised fuel ash  
cenospheres. The cellulosic fibres may  
be first dispersed in a solution of  
potassium silicate and/or sodium  
silicate before adding the resultant  
liquid dispersion to the dry  
ingredients.

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# **SPECIFICATION** **Improvements in and Relating to Board** **Products and Mouldings**

This invention relates to a novel composition  
5 for boards and mouldings of the type which in the  
past have comprised light weight aggregate and  
potassium silicate or sodium silicate binder.

Typical light weight aggregates include  
vermiculite, perlite, and pulverised fuel ash  
10 cenospheres and are usually inorganic.

The usual process for manufacturing this type  
of board or moulding normally involves the use of  
potassium or sodium silicate in solution with  
water, and usually includes the steps of mixing,  
15 pressing and stoving.

This type of board or moulding is used for a  
variety of applications but is especially suitable for  
fire resistant and high temperature insulation  
applications. This type of board or moulding does  
20 however have the disadvantage of being friable,  
which results in excessive breakages in handling,  
transportation and application, and also in the  
product not being suitable for application  
methods which involve mechanical means such  
25 as drilling, screwing, the use of clips and brackets  
and so on.

The usual methods of application for these  
materials have in the past included the use of wet  
cements or adhesives, and have become much  
30 less attractive because of the messy nature of the  
process, and many skilled applicators of these  
materials now prefer to avoid the use of wet  
cements or adhesives and to use instead  
materials which can be fixed by mechanical  
35 means.

According to the present invention a  
composition is provided for the manufacture of  
boards and mouldings, comprising potassium  
silicate and/or sodium silicate, light weight  
40 aggregate and cellulosic fibres, which will be  
more suitable for application by mechanical  
means. The ingredients are preferably present in  
the following proportions by dry weight:

	%
45 Potassium silicate and/or sodium silicate	3—25
Light weight aggregate	55—95
Cellulosic fibres	$\frac{1}{2}$ —20

The particularly preferred proportions are in the  
50 ranges 7—20%, 80—90%, and 2—8% by weight  
respectively.

The preferred maximum amount of cellulosic  
fibre when the application is to be a fire resistant  
one is 5%.

55 The density of the resultant product made from  
this composition will ordinarily have a density in  
the range 300—800 kg/m<sup>3</sup>.

It is preferable in the mixing operation to first  
disperse the cellulosic fibres in the potassium  
60 and/or sodium silicate solution and then to add  
this liquid dispersion to the dry ingredients in the  
mixer.

An example of a preferred composition  
according to this invention is as follows by dry  
65 weight:

	%
Potassium silicate and/or sodium silicate	15
Vermiculite and/or pulverised 70 fuel ash cenospheres	81
Cellulosic fibres	4

The advantage of boards and mouldings made  
in accordance with this invention lies in their  
increased toughness and better suitability for  
75 application or installation using mechanical  
methods, such as drilling, screwing, use of clips,  
brackets and so on, and also in much reduced  
breakages in handling, transportation and  
application.

## **80 Claims**

1. A composition suitable for the manufacture  
of building boards and mouldings comprising  
potassium silicate and/or sodium silicate, light  
weight aggregate and cellulosic fibres.

85 2. A composition as claimed in Claim 1 in  
which the light weight aggregate is vermiculite  
and/or pulverised fuel ash cenospheres.

3. A composition as claimed in Claim 1 in  
which the ingredients are present in the following  
90 percentages by dry weight:—

	%
Potassium silicate and/or sodium silicate	3 to 25
Light weight aggregate	55 to 95
95 Cellulosic fibres	$\frac{1}{2}$ to 20

4. A method of making building boards or  
moulding from compositions as claimed in any  
preceding claim, which includes the steps of  
mixing the ingredients, pressing and stoving or air  
100 drying.

5. A method of mixing the moulding  
compositions as claimed in Claims 1 to 3 which  
includes the step of first dispersing the cellulosic  
fibres in a solution of potassium silicate and/or  
105 sodium silicate and then adding this liquid  
dispersion to the dry ingredients.

6. Building boards or mouldings made from  
compositions as claimed in Claims 1 to 3.